AMENDMENTS TO THE SPECIFICATION:

On page 1, please amend the title as follows:

PHOTONIC CRYSTAL REFLECTORS/FILTERS AND
~~DISPLACMENT~~ DISPLACEMENT SENSING APPLICATIONS

On page 1, please amend Paragraph **[0004]** as follows:

[0004] 1. "Sub-10cm3 interferometric ~~accerlometer~~ accelerometer with nano-g resolution" by N. C. Loh, M. A. Schmidt, S. R. Manalis, J. Microelectromechanical Syst. 11, 181 (2002);

On page 8, please amend Paragraph **[0041]** as follows:

[0041] Figure 2(b) is a graphical illustration of the transmission through the slabs of Figure 1, where the direct reflection coefficient rd is zero, the direct transmission td is one, and thus the transmission spectrum 26 (solid line) exhibits a symmetric line shape around the resonance frequency. The line shape 26 is a Lorentzian that is symmetric with respect to the resonance frequency (Figure 2(b)), where the background transmission 28 is shown in dotted line. See "New principle for optical filters", by R. Magnusson and S. S. Wang, Appl. Phys. Lett. 61, 1022 (1992). The background transmission and reflection coefficients rd and td are primarily determined by the thickness and the dielectric constant of the slab, while the frequencies of the guided resonance is strongly influenced by the periodicity of the crystal lattice and the size of the air holes. (See "Analysis of guided resonances in photonic ~~crytal~~ crystal slabs", S. Fan and J. D. Joannopoulos, Phys. Rev. B, 65, 235112 (2002). Hence, we can design crystal structures that possess either type of line shape.

On page 10, please amend Paragraph **[0046]** as follows:

[0046] The transmission through an optical cavity is sensitive to the variation of the distance between the mirrors when the reflectivity of both mirrors approach unity. At optical wavelengths, one way to construct highly reflecting mirrors is to use transparent dielectric materials since metals are inherently ~~lossy.~~ **glossy.** While it is possible to use multi-layer dielectric mirrors, constructing two such mirrors in a MEMS-tunable cavity configuration remains a challenge. The novelty and the significance of our approach lie in its simplicity: we exploit the fact that high reflectivity can be achieved in a single dielectric layer by introducing in-plane periodic index contrast. This structure should therefore greatly simplify the fabrication complexity in the MEMS structure.

On page 12, please amend Paragraph **[0051]** as follows:

[0051] As indicated in Figure 3(a), in the far-field coupling regime the two slabs support a resonance around w=0.53c/a. The near-field coupling between the slabs illustrated in Figure 4 splits the resonance and creates two resonant lines. In addition, a lateral shift of 0.05a along the (10) direction between the two slabs 12 in Figure 1 breaks the four-fold rotational symmetry of the structure, and introduces extra resonances into the transmission spectra. Such resonances correspond to the singly degenerate states that are uncoupled ("Analysis of guided resonances in photonic crytal slabs", by S. Fan and J. D. Joannopoulos, Phys. Rev. B, 65, 235112 (2002); "Dispersion relations and optical ~~transmissin~~ **transmission** of a hexagonal photonic crystal", T. Ochiai and K. Sakoda, Phys. Rev. B 63, 125107 (2001)) when the two slabs are aligned. The calculation thus demonstrates that the near-field coupling regime provides the additional possibility of lateral displacement sensing.

On page 17 and continuing onto page 18, please amend Paragraph **[0070]** as follows:

[0070] Figure 11 is a schematic view of a displacement-sensitive photonic crystal structure 300 comprising at least one photonic crystal slab 12 and a reflective medium 302 to illustrate yet one more embodiment of the invention. In one implementation, medium 302 comprises a distributed Bragg mirror, such as one formed by alternate layers of materials having different ~~dielectirc~~ **dielectric** constants. Structure 300 can be used in a manner similar to structures 10 and 200 described above, with all the attendant advantages also described above.